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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,301	08/27/2003	Robert G. Komarechka	KOMAR	3664

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EXAMINER	
WOODS, ERIC V	
ART UNIT	**PAPER NUMBER**
2672	

DATE MAILED: 04/19/2005

Mike M. Gauthier
1264156 Ontario Incorporated
o/a Deviat
959 Elisabella Street, Unit C
Sudbury, P3 A 5K1
CANADA

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/648,301	KOMARECHKA, ROBERT G.	
	Examiner	Art Unit	
	Eric V Woods	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4* is/are rejected.

7)☒ Claim(s) *5* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The disclosure is objected to because of the following informalities: on page 17, line 22, the terms "claims 79(c)" are used and there is not an explanation for this, nor is there a 79(c) in the claims.

Appropriate correction is required.

Information Disclosure Statement

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A (1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the examiner cites those references on form PTO-892, they have not been considered. Given that applicant relies on them in the specification and cites them, applicant needs to file an IDS with copies of such references.

The listing of references is objected to because the full title of the reference labeled as (3) is "Vector Field Animation with Texture Maps" not "Vector Field Animation with Maps" and further the author should be listed as Yamrom, B. not simply Yamrom, assuming that that is the particular reference meant by applicant.

Drawings

Examiner accepts the drawings.

Claim Objections

Claim 5 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim is only allowed to be dependent upon other claims in the alternative, e.g. "method of claims 1, 2, **or** 3" not the positive wording of applicant, e.g. "method of claims 1, 2, **and** 3". See MPEP § 608.01(n).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mueller et al (Mueller et al. "Combined 3-D Interpretation of Airborne, Surface, and Borehole Vector Magnetics at the McConnell Nickel Deposit") in view of Crawfis et al (Crawfis, R. et al. "Direct Volume Visualization of Three-Dimensional Vector Fields") further in view of Kerekes et al (US PGPub 2002/0128779 A1).

As to claim 1, reference Crawfis clearly teaches the use of three dimensional vector orientations on a two-dimensional surface (e.g. a computer monitor)(see abstract, page 55), specifically for the visualization of three-dimensional vector fields on computer monitors, where prima facie a three-dimensional vector field will show vector orientations. Reference Mueller clearly establishes (see Abstract, page 657) that three-

dimensional magnetic vector data was obtained during the survey, along with other data concerning the deposit, and two-dimensional representations of the vector field are shown in Figure 1 on page 658, whilst a three-dimensional visualization of some magnetic orientations with direction information is shown in Figure 2 on page 658, which clearly illustrates three-dimensional vector orientations in any case. Reference Kerekes is a teaching reference for certain details of coordinate mapping, which shows a three-dimensional model of borehole locations in Fig. 1, and in Fig. 14, step 152, the system clearly generates a three-dimensional image and in [0005-0006] it teaches that the purpose of the invention is map the three-dimensional vector field of the geologic formation in question. All three references are analogous art and are directed to the same problem solving area, in that they are all directed to visualization and processing of geologic data in three dimensions and vector fields generally as noted in the above paragraphs.

Next, reference Mueller on pages 658 and in more detail on pages 659 and 660 establishes how the magnetic data was gathered, in that it is three-dimensional and gathered by airborne, surface, and borehole investigations. Kerekes teaches the acquisition of such data from boreholes, as in Fig. 1 and as taught in [0004-0006] it clearly represents data gathering as well, while Crawfis is more focused on data visualization. Kerekes measures generated “complete vector fields” [0025] which clearly represent the total 3D vector map. Therefore, both Kerekes and Mueller teach collecting three-dimensional information.

Such information is typically gathered in orthogonal (Cartesian) coordinates, as Kerekes does in [0026] and particularly in [0032], where it is stated the sensing apparatus has three orthogonal sensors, thusly the signals generated are orthogonal and thusly would inherently be in a Cartesian coordinate system or reference frame, where a transform is applied to it to generate three-dimensional spherical coordinate data [0032-0033]. Clearly, such spherical coordinates are assigned a predetermined display pattern, wherein in Fig. 14, step 152, and the three-dimensional image is generated, which obviously has a form and pattern to it. Clearly Mueller teaches in Figs. 1 and 2 on page 658, particularly Fig. 2, specific patterns. All three references teach the display, e.g. plotting, of such vector fields on the screen of a computer monitor, e.g. a two-dimensional surface.

Kerekes teaches the calibration of equipment for three-dimensional measurements in Fig. 4 [0011], and especially in [0027] where it is taught that each borehole is specifically calibrated for location, azimuth, position, etc., which clearly establishes a step of "calibrating said three-dimensional information", given that this step can performed at any time during the process.

Mueller clearly teaches in Figs. 1 and 2 on page 658 the use of a method for rapidly and visually determining the orientation of vectors within a 2D and 3D field respectively, as those arrows can obviously be in color, and color visualizations techniques are well known in the art, as taught by Crawfis in pages 56-57, particularly the right side of page 56 and as illustrated in Fig. 3. Crawfis illustrates on page 60 the use of varying colors in vector field illustrations, particularly in for example Figure 8.

The use of different colors in vectors definitely constitutes the recited step (iv) of "rapidly visually correlating 3D vectors of a common orientation", since vectors of a comparable color and direction would be easily visually ascertained (e.g. see Crawfis page 56).

Specific vector points can be seen in the graphs of Crawfis (e.g. Fig 3, page 57) and Mueller (Figs. 1 and 2), and clearly one could extract vector orientations based on the line leading away from the point in question, and the exact coordinate location, as in page 658, where it states that "the arrows within Figure One indicate the direction and intensity of the magnetic field", and clearly the points are laid out on a grid; it is a trivial modification and well known in the art to have a graph set up such that a user can click on a point and the system will show the exact coordinates of the point or item in question to get more details.

Applicant shows in his drawings in Fig. 10 what he terms 'scatter plots' which are nothing more than another way of display vectors (e.g. such a technique is taught in Mueller Figs. 1 and 2, Crawfis Figs. 3 and 5-8, and prima facie in Kerekes [0058-0062]), and a study volume is illustrated in Figs. 1 and 2 of Mueller. Further, it is trivially well known in the art to have visualization programs that allow zooming or specification such that a user can view only a selected range or coordinate volume.

Clearly, the color schemes of Mueller and particularly those of Crawfis teach the use of subtle color patterns to "enhance the visual discrimination of subtle variation", and such schemes can prima facie be adjusted so that more subtle variations have wider color variations (just a question of the degree of grading in the color) and one of

ordinary skill in the art would be able to modify the system to do so in a trivially easily manner (e.g. a few lines of graphics / OpenGL™ code).

Finally, Kerekes in [0027-0034] explains the operation of his system, wherein data is inherently taken in time-based format, where the time of reception of the signal allows the user to derive information about the sub-surface features in question. Crawfis clearly teaches on page 55 that systems that utilizes particles to illustrate movement are time-based and further that his work generates data that has time steps and time dynamics, which clearly means that the data is moving with respect to time, and obviously for a climate simulation to be useful, it must be able to be viewed in a time mode. It is trivially well known in the art to implement playback systems for such simulation data – such data are shown on television, in movies, and at conferences in moving format all the time. Obviously, the work of Crawfis encompasses such, but since it is only a paper, no video clip could be attached to illustrate the true movement of their simulations, but many screenshots were. In any case, setting the playback speed is also trivially well known (see Microsoft Windows™ Media Player, Realplayer, or any other media player type system). Obviously, for a time-based simulation, the dynamics must be viewable in order to be comprehensible. Also, the reason one would want to control the playback speed of such a simulation is to allow more careful study of the changes between different steps and/or frames, whether in a climatic data set such as Crawfis or in time-based data such as Kerekes.

For the reasons set forth in the first and second paragraphs of this rejection, It would have been obvious to one having ordinary skill in the art at the time the invention

was made to combine the systems of Kerekes, Crawfis, and Mueller in the manner set forth above and to modify them for the reasons and in the manners set forth above.

As to claim 2, this is a trivially obvious variation. Personal computers have been capable of printing screen shots ever since the 1980s, and originally the "PrintScreen / SysRq" button on an IBM PC was capable of printing the screen when it was pressed, and clearly such functionality is a fundamental of the art. Further, printers and plotting devices have been known for twenty years, and this is a trivially obvious variant. Motivation and combination are taken from the parent claim.

As to claim 3, obviously reference Mueller teaches geomagnetic data. Since only the primary reference is utilized, no separate motivation or combination is required and that from the rejection to the parent claim is herein incorporated by reference.

As to claim 4, reference Mueller teaches data gathered by airborne means (page 660), surface means (page 660), and boreholes (pages 657-658, Figure 2, et cetera). Clearly such measurements, since they are three-dimensional, are inherently triaxial (as are the measurements of Kerekes). That satisfies three of the conditions on the list, and it is merely "of the list" which means all four limitations are not required. Motivation and combination is taken from the rejection to the parent claim.

Allowable Subject Matter

Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

This claim would be allowable because the prior art teachings, for example the Muller reference and Thurston (J.B. Thurston, "Mapping remnant magnetization using the local phase"), do not perform all the recited steps, in that they never recite the abilities to determine the extent of thermal aureoles above the Curie or Ne'el temperature of rocks, or to determine the chemical alteration of pre-existing rock.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric V Woods whose telephone number is 571-272-7775. The examiner can normally be reached on M-F 7:30-4:30 alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on 571-272-7664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eric Woods

Eric Woods April 11, 2005

Jeffrey A. Brier